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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* YUHONG FANG, ARUN GANESH, and GUANGYI LUO

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Appeal 2016-005300
Application 13/513,654[1]
Technology Center 2800

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Before ROMULO H. DELMENDO, KAREN M. HASTINGS, and JAMES C. HOUSEL, *Administrative Patent Judges*.

PER CURIAM.

DECISION ON APPEAL

The Appellants appeal under 35 U.S.C. § 134(a) from the Primary Examiner's final decision to reject claims 1, 4, 8–14, and 21.[2] We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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[1] The Applicants (hereinafter "Appellants") state that the real party in interest is "Koninklijke Philips N.V." (Appeal Brief filed on July 13, 2015, hereinafter "Appeal Br.," 2).

[2] Appeal Br. 4–19; Reply Brief filed on April 25, 2016, hereinafter "Reply Br.," 3–11; Final Office Action (notice emailed on January 20, 2015), hereinafter "Final Act.," 2–10; Examiner's Answer (notice emailed on February 25, 2016), hereinafter "Ans.," 2–9.

## BACKGROUND

The subject matter on appeal relates to an electronic ballast to provide power to a lamp, wherein the ballast decreases its output power when its temperature exceeds a threshold, thus protecting the ballast from high temperature while keeping the lamp on but at a reduced light output (Specification, hereinafter "Spec.," 1, ll. 5–9; 5, ll. 6–11). Representative claim 1 is reproduced from page 2 of the Appeal Brief (Claims Appendix) (emphasis added), as follows:

> 1. An electronic ballast operably connected to provide power to a lamp, the electronic ballast comprising:
>
> a PFC converter operable to receive a PFC input voltage and operable to provide a DC bus voltage on a DC bus;
>
> a DC/AC converter operable to receive the DC bus voltage from the DC bus and to provide AC power to the lamp at an AC output frequency; and
>
> a compensator responsive to an electronic ballast condition parameter, the compensator being operable to provide a compensator signal to at least one of the PFC converter and the DC/AC converter;
>
> wherein the at least one of the PFC converter and the DC/AC converter is responsive to the compensator signal to reduce the power to the lamp when the electronic ballast condition parameter passes an electronic ballast condition parameter threshold,
>
> wherein the electronic ballast condition parameter is the electronic ballast temperature, the compensator signal is a DC bus adjust signal, and *the PFC converter is responsive to the DC bus adjust signal to reduce the DC bus voltage when the electronic ballast temperature is greater than a threshold electronic ballast temperature*.

REJECTIONS ON APPEAL

The Examiner rejected the claims as follows:[3]

I. Claim 23[4] under pre-AIA 35 U.S.C. 112, second paragraph, as being indefinite;

II. Claims 1, 10, and 11 under pre-AIA 35 U.S.C. § 102(b) as anticipated by Zhai et al.[5] (hereinafter "Zhai");

III. Claim 4 under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Zhai in view of Ribarich[6] (hereinafter "Ribarich");

IV. Claims 8 and 9 under pre-AIA 35 U.S.C. § 103(a) over Zhai in view of Nerone[7] (hereinafter "Nerone");

V. Claims 12–14 under pre-AIA 35 U.S.C. § 103(a) over Zhai in view of Ribarich and further in view of Nerone; and

VI. Claim 21 under pre-AIA 35 U.S.C. § 103(a) over Zhai in view of Alexandrov[8] (hereafter "Alexandrov").

(Final Act. 2–14; Ans. 2–9.)

[3] Claims 3, 5, 22, 23 were indicated as including allowable subject matter (Final Act. 8).
[4] The Examiner withdrew the rejection of claim 13 under pre-AIA 35 U.S.C. § 112, second paragraph (Ans. 2).
[5] WO 2008/014632 A1, published on February 7, 2008.
[6] US 2008/0054824 A1, published on March 6, 2008.
[7] US 2009/0058302 A1, published on March 5, 2009.
[8] US 2006/0006816 A1, published on January 12, 2006.

## DISCUSSION

### *Rejection I*

Claim 23 is rejected as indefinite because it depends from a canceled claim (Final Act. 3).[9] However, no arguments regarding the impropriety of the rejection have been submitted by the Appellants. We therefore summarily affirm the Examiner's § 112 rejection of claim 23.

### *Rejection II*

Claims 1, 10, and 11 are rejected under § 102(b) over Zhai. We address claims individually below only to the extent that they have been argued separately within the meaning of 37 C.F.R. § 41.37(c)(1)(iv). The Appellants submit arguments traversing the § 102 rejection of claim 1 over Zhai (Appeal Br. 8–13). For dependent claims 10 and 11, the Appellants reiterate the arguments for claim 1 and merely cite the additional recitations of claims 10 and 11 (*id.* at 13). Skeletal arguments or arguments merely amounting to assertions that the references do not disclose or suggest certain claim limitations are not arguments for separate patentability within the meaning of 37 C.F.R. § 41.37(c)(1)(iv). *See In re Lovin*, 652 F.3d 1349, 1356–57 (Fed. Cir. 2011). Thus, the Appellants have not set forth arguments for the separate patentability of claims 10 and 11, and we select claim 1 as representative of the issues discussed below.

The dispositive issue on appeal is whether Appellants have identified reversible error in the Examiner's finding that Zhai discloses a ballast including a PFC converter that "is responsive to the DC bus adjust signal to

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[9] The Appellants attempted to amend claim 23 via an after-Final claim amendment submitted on April 1, 2015 so that claim 23 would instead depend from claim 1. However, an Advisory Action issued on May 1, 2015 stated the claim amendment was not entered.

reduce the DC bus voltage when the electronic ballast temperature is greater than a threshold electronic ballast temperature," as recited in claim 1. For the reasons discussed below, we find the Appellants have not identified such an error.

The Examiner finds Zhai discloses a power factor correction circuit 36 that functions as the PFC converter of claim 1, an inverter 38 that functions as the DC/AC converter of claim 1, and a sensing and control circuit 40 that, in combination with a compensator 62 disclosed by Zhai, functions as the compensator of claim 1 (Final Act. 4).

The Appellants do not dispute the functions of the individual components of Zhai's ballast that have been cited by the Examiner. Rather, the Appellants state that Zhai discloses an arc detection and prevention circuit in which a sensing and control circuit 40 "senses and monitors an input to inverter 38 and can cause a change in the input to the inverter by adjusting, changing, or shutting down either the power factor control circuit or the inverter circuit when the power (not temperature) going into the inverter circuit is above a threshold" (Appeal Br. 9–10) (emphasis omitted). The Appellants further state the temperature compensator 62 of Zhai, which may include a negative temperature coefficient resistor, "adjusts the sensing and control circuit 40 as a function of the temperature in the ballast" so "the sensing and control circuit 40 is able to remain relatively immune to temperature fluctuations" (*id.* at 10) (emphasis omitted).

The Appellants contend:

> Although the disclosure of Zhai et al. describes using a negative temperature coefficient resistor, nowhere does Zhai et al. disclose that, as a result of that sensed temperature, the PFC converter is responsive to the DC bus adjust signal to reduce the DC bus voltage when the electronic ballast temperature is greater

> than a threshold electronic ballast temperature," as recited in claim 1.

(*Id.*) (emphasis omitted).

In response to the Appellants' arguments, the Examiner explains the Appellants argue a stricter (i.e., narrower) claim scope than what is present in claim 1 because claim 1 recites the PFC converter is responsive to a DC bus adjust signal "when" the ballast temperature is greater than a threshold temperature, not "as a result of" the ballast temperature being greater than the threshold (Ans. 4). The Examiner finds the temperature compensator of Zhai functions to allow the sensing and control circuit to be relatively immune to fluctuations in ballast temperature when the ballast temperature is greater than a threshold set by a circuit section in Figure 3 of Zhai (*id.*). The Examiner finds the function of the temperature compensator 62 "is in conjunction with and occurs at the same time (or 'when') Zhai's compensator signal . . . adjusts the DC bus voltage from its PFC converter (el. 36) to the DC/AC converter (el. 38) . . . to reduce power to the lamp or reduce the DC bus voltage" (*id.*).

The Appellants respond to the Examiner's findings and reasoning by asserting the Examiner's interpretation of "when" is overly broad, not in view of the Appellants' Specification, and without regard to the context of claim 1 (Reply Br. 6–7). In particular, the Appellants contend the functions of the temperature compensator 62 and the sensing and control circuit 40 are two independent events that do not correspond to the cause and effect relationship required by the language "the PFC converter is responsive to the DC bus adjust signal to reduce the DC bus voltage when the electronic

ballast temperature is greater than a threshold electronic ballast temperature" of claim 1 (*id.* at 7).

The Appellants' arguments do not demonstrate that the Examiner's interpretation of claim 1 is unreasonable or that the ballast of Zhai would not inherently function to issue a signal to the power factor correction circuit 36 to shutdown at the same time the temperature of Zhai's ballast is high, which results in the compensator 62 functioning to regulate the operation of the sensing and control circuit 40. We agree with the Examiner that the language of claim 1 does not require a cause and effect relationship between a ballast temperature and a PFC converter being responsive to a DC bus adjust signal to reduce a DC bus voltage. Rather, the language of claim 1, particularly the term "when," merely requires these conditions to occur at the same time. For example, claim 1 encompasses the situation in which a PFC converter is responsive to the DC bus adjust signal when a temperature compensator (i.e., compensator 62 of Zhai) is already compensating for a ballast temperature that is above a threshold electronic ballast temperature (e.g., a temperature at which compensator 62 operates to regulate the functioning of the sensing and control circuit 40).

Zhai describes such a situation. Zhai discloses that the sensing and control circuit 40 monitors the input to the inverter 38 and causes a change in input to the inverter 38 via an input to the power factor correction circuit 36 (Zhai 9, ll. 18–23). Specifically, Zhai discloses that when the magnitude of the input current is too high, the sensing and control circuit 40 issues a signal to the power factor correction circuit 36 to turn off, which results in the voltage available at the output of inverter 38 being reduced (*id.* at 10, ll. 13–23). Zhai further discloses the compensator 62 adjusts the sensing and

control circuit 40 to compensate for environmental variations, such as variations in temperature (*Id.* at 11, ll. 15–19). Thus, when the ballast is at a high temperature (i.e., above a threshold temperature), compensator 62 functions to adjust the functions of the sensing and control circuit 40. One of ordinary skill in the art would understand from Zhai's disclosure that the sensing and control circuit 40 detects that an input current is too high and issues a signal to the power factor correction circuit 36 while the compensator 62 functions in this manner at a high ballast temperature. Therefore, Zhai inherently discloses the limitations of claim 1. Moreover, the Examiner finds Zhai discloses a ballast having the structure recited in claim 1 and, for the reasons discussed above, these structures are capable of performing the functions recited in claim 1.

For these reasons including those set forth by the Examiner, we uphold the Examiner's rejection of claims 1, 10, and 11.

*Rejection III*

Regarding claim 4, the Examiner finds Zhai does not disclose, among other things, that a PFC converter is further responsive to a DC bus adjust signal when a PFC input voltage is less than a threshold PFC input voltage (Final Act. 6). However, the Examiner finds Ribarich discloses such a threshold and concludes it would have been obvious to include the threshold in the ballast of Zhai "to prevent damage to components or unintended extinguish of the lamp" (*id.*).

The Appellants contend Ribarich does not remedy the deficiencies of Zhai because Ribarich discloses thresholds for "an under-voltage reset threshold included by the VBUS pin and an IC start-up threshold (UVLO+)"

but not a threshold PFC input voltage, a DC bus adjust signal, or a PFC converter responsive to a DC bus adjust signal (Appeal Br. 15).

The Examiner responds by finding Ribarich discloses a condition for an input voltage, which would be the voltage from the input circuit 68 to the power factor correction circuit 72 in Figure 3 of Zhai,[10] decreasing to a value that is too low and causing a near or below resonance shift, which Ribarich's method avoids (Ans. 8–9). In other words, the Examiner considers what the combination of the disclosures of Zhai and Ribarich, taken as a whole, would have suggested to one of ordinary skill in the art. *In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971). Moreover, Ribarich supports the Examiner's findings and conclusion by disclosing an under-voltage reset threshold for a VBUS pin to prevent hard switching that can damage half-bridge switches or cause a lamp to extinguish (Ribarich ¶ 75).

The Appellants do not respond to the Examiner's findings or reasoning in the Examiner's Answer, other than to respond to a comment about the clarity of claim 4 and whether it is permissible to claim more than one electronic ballast condition parameter (Reply Br. 9–10). Therefore, the Appellants have not directed us to reversible error in the Examiner's rejection.

For these reasons, we uphold the Examiner's rejection of claim 4.

*Rejections IV–VI*

For claims 8, 9, and 21, the Appellants rely on the same arguments offered for claim 1 and assert the additional subject matter recited in these claims (Appeal Br. 16, 19). Because we did not find the arguments offered

[10] Zhai 11, l. 28 to 12, l. 10.

for claim 1 persuasive, we also uphold the Examiner's rejections of claims 8, 9, and 21 for the same reasons.

For independent claim 12, the Appellants reiterate the arguments presented for claim 1 and contend Nerone does not cure the deficiencies of Zhai (*id.* at 16–19). For the reasons set forth above, there are no deficiencies in the rejection of claim 1 that require curing by Nerone. The Appellants assert claims 13 and 14 are patentable for the same reasons as claim 12 and for their additional recitations (*id.* at 19). We therefore uphold the Examiner's rejection of claims 12–14 for the same reasons as for the rejection of claim 1.

## SUMMARY

Rejections I–IV are affirmed. Therefore, the Examiner's final decision to reject claims 1, 4, 8–14, and 21 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

## AFFIRMED